COMP9444 Neural Networks and Deep Learning

Quiz 3 (Convolutional Networks)

This is an optional quiz to test your understanding of the material from Week 3.

- 1. Write the formula for activation $Z^{i}_{j,k}$ of the node at location (j,k) in the I^{th} filter of a convolutional neural network which is connected by weights $K^{i}_{l,m,n}$ to all nodes in an $M \times N$ window from the L channels in the previous layer, assuming bias weights are included and the activation function is g(). How many free parameters would there be in this layer?
- 2. If the previous layer has size $J \times K$, and a filter of size $M \times N$ is applied with stride s and zero-padding of width P, what will be the size of the resulting convolutional layer?
- 3. If max pooling with filter size F and stride s is applied to a layer of size $J \times K$, what will be the size of the resulting (downsampled) layer?
- 4. Explain how dropout is used for neural networks, in both the training and testing phase.
- 5. Explain the concept of Data Augmentation, and how it was used in AlexNet.

Make sure you try answering the Questions yourself, before checking the Sample Answers